



Lessard-Sams Outdoor Heritage Council

Knife River Habitat Rehabilitation-Phase III Laws of Minnesota 2018 Accomplishment Plan

General Information

Date: 02/25/2022

Project Title: Knife River Habitat Rehabilitation-Phase III

Funds Recommended: \$927,000

Legislative Citation: ML 2018, Ch. 208, Art. 1, Sec. 2, subd 5(k)

Appropriation Language: \$927,000 the second year is to the commissioner of natural resources for an agreement with Zeitgeist, in cooperation with the Lake Superior Steelhead Association, to enhance trout habitat in the Knife River watershed. A list of proposed enhancements must be provided as part of the required accomplishment plan.

Manager Information

Manager's Name: Tony Cuneo and Kevin J. Bovee

Title: Exec. Dir. & Project Manager

Organization: Zeitgeist and Lake Superior Steelhead Association

Address: 222 E. Superior Street P. O. Box 16034, Duluth, mn 55816

City: Duluth, MN 55802

Email: Tony@ZeitgeistArts.com

Office Number: 218-336-1410

Mobile Number: 218-525-5960

Fax Number:

Website: www.ZeitgeistCenterforArts and Community.org and www.steelheaders.org

Location Information

County Location(s): Lake.

Eco regions in which work will take place:

- Northern Forest

Activity types:

- Enhance

Priority resources addressed by activity:

- Wetlands

- Forest
- Habitat

Narrative

Abstract

Poor historic forestry practices in the Knife River watershed have degraded trout habitat and resulted in a TMDL exceedance for turbidity. LSSA used the new MPCA and Natural Channel Design evaluation criteria to rank and prioritize locations (reaches) for rehabilitation in the upper Knife River watershed. Phase III will work on the top 30% of Reach 4. Phase III focus will be stabilizing streambanks, installation of instream habitat and replanting riparian forest. Only stream sections located on public lands and private lands with DNR easements will be considered for work. See the LSSA supplementary video for more information.

Design and Scope of Work

The Knife River watershed once held one of the largest populations of natural reproducing steelhead in the Great Lakes. Since the late 1970's, the Knife River steelhead population has seen a dramatic decline. One major reason for this decline is habitat loss. Habitat loss is a long-term result from historic logging. The pre-settlement forest composition within the Knife River watershed consisted of old growth coniferous trees. Extensive logging removed these trees throughout the watershed, which were replaced by large stands of second growth aspen. This large-scale forest alteration removed the large trees that stabilized the stream banks and attracted unprecedented beaver populations to the watershed due to the new aspen food source. This combination has led to a rapidly deteriorating riparian zone that now includes slumping stream banks, dead trees and remnant beaver meadows. The slumping clay banks have also resulted in a TMDL exceedance for turbidity on the Knife River. Recognizing the threat to the upper river, the DNR started performing limited stream studies. These studies have determined that habitat degradation in the watershed has resulted in poor rearing conditions for juvenile trout.

The goal of Phase III is to rehabilitate stream banks, wetlands, fish habitat and riparian zone trees that have been impacted over the past 100 years. The LSSA used a combination of aerial data (LIDAR) and river surveys to locate and assess impacted stream areas within the Knife River watershed. A field reconnaissance and detailed stream survey using MPCA and Natural Channel Assessment methodology determined the stream's condition. Reach 4 (Upper Main Knife River) was ranked very high for a rehabilitation project. Rehabilitation of Reach 4 will be conducted by using design/build construction following Natural Channel Design criteria to achieve a stable stream reach. Phase III will rehabilitate approximately the top 30% of the entire Reach 4 complex. Our scope of work may include:

- * Survey the stream using MPCA and NCD methodology.
- * Conduct baseline and periodic stream and biological data collection and monitoring on impact areas.
- * Track fish movement within the watershed.
- * Monitor water temperature/quality.

- * Conduct fish shocking.
- * Identify erosion areas.
- * Measure streamflow.
- * Complete permit applications
- * Meet with regulators to receive project approvals.
- * Conduct stakeholder meetings.
- * Remove log jams/beaver blockages to restore connectivity.
- * Restore stream flow.
- * Create and restore wetlands and off-channel ponds.
- * Perform design/build projects to stabilize streambanks, restore channels and install woody debris using natural channel methodology.
- * Remove impounded silt and sediments from the streambed.
- * Planting trees and shrubs to restore the overhead canopy.
- * Increase spawning/rearing habitat.
- * Add large woody debris, rock vanes and “J” hooks into the stream.
- * Post construction survey.

By LSOHC recommendation, Zeitgeist and LSSA are partnering in Phase III of this project to meet all of the shared environmental and administrative objectives. Zeitgeist brings additional administrative capacity to the significant success the LSSA has already shown. Our project work is consistent with the Minnesota Constitution, statutes and state laws and has been conducted in a transparent manner using state of the art.

How does the plan address habitats that have significant value for wildlife species of greatest conservation need, and/or threatened or endangered species, and list targeted species?

The Knife River is a unique watershed on Minnesota’s North Shore of Lake Superior. While the North Shore has over 60 tributaries that discharge to Lake Superior, only the Knife River does not have a barrier waterfall that limits upstream migration of steelhead or coaster brook trout. This lack of a barrier falls means the Knife River has over 70 miles open to anadromous Steelhead and coaster brook trout habitat.

The Knife River also has another unique feature; according to DNR research by Charles Kruger, the Knife River has a genetically distinct strain of steelhead. Not only are these steelhead genetically distinct from other North Shore watersheds, but the Knife River steelhead are genetically distinct within its watershed. So this means that Main Knife River steelhead are genetically different than steelhead that are produced in its tributaries of Stanley Creek, McCarthy Creek, Main West Branch, Little West Branch, Captain Jacobson and Little Knife River.

This proposal addresses the uniqueness of the Knife River fishery by enhancing the trout habitat so the steelhead, coaster brook trout and anadromous brown trout are allowed to spawn, rear and migrate back to Lake Superior to grow and mature. This fact is even more critical because the Knife River is no longer stocked with trout. Stocking was discontinued in the Knife River to protect the unique genetics of over 100 years of natural steelhead production. Essentially the Knife River is a natural wild fish hatchery that continues to genetically evolve.

Describe how the plan uses science-based targeting that leverages or expands corridors and complexes, reduces fragmentation or protects areas identified in the MN County Biological Survey:

The LSSA has assessed the Knife River water temperature to determine which stream sections support trout production. Our temperature monitoring uses data loggers to record water temperature every hour over a four-month summer time period. This assessment data has allowed the LSSA to conclude where the Knife River has suitable water temperature conditions to support trout survival. By overlaying this data on our watershed map, we have created what we call “trout zones”.

After we mapped these “trout zones” in the Knife River, we realized that the upper watershed had the coolest water temperatures suitable for the growth of trout, the middle watershed had warmer water temperatures that were stressful for trout and the lower watershed had the hottest water that is lethal for trout. This data is being used in two ways. One, it tells us to avoid performing construction projects in the lower watershed because the summertime water temperatures are lethal for trout. So even if we created the best in-stream habitat features in the lower watershed, the water temperature would not allow for juvenile trout survival. Two, it gives us an area where we should construct projects to get the best return on investment.

Another assessment tool that we use is a full biological survey. This survey evaluates the fish population through shocking, invertebrate community through kick nets and using the new MPCA habitat numerical assessment protocol. Using the full biological assessment tool allows us to track if our project has had an impact in the stream reach that we are currently working on and if there is a positive impact downstream. It is anticipated after completing several projects, our cool water corridor would extend downstream because the river channel will be narrower and deeper, consist of a canopied riparian zone and have undercut banks. So over time, once the cool water corridor is extended downstream, the “trout zone” should increase on the Knife River. If our hypothesis is correct, our temperature and biological monitoring will open new areas to perform stream habitat improvement downstream.

Which two sections of the Minnesota Statewide Conservation and Preservation Plan are most applicable to this project?

- H2 Protect critical shoreland of streams and lakes
- H6 Protect and restore critical in-water habitat of lakes and streams

Which two other plans are addressed in this program?

- Long Range Plan for Fisheries Management
- National Fish Habitat Action Plan

Which LSOHC section priorities are addressed in this program?

Northern Forest

- Protect shoreland and restore or enhance critical habitat on wild rice lakes, shallow lakes, cold water lakes, streams and rivers, and spawning areas

Does this program include leveraged funding?

-

Non-OHF Appropriations

Year	Source	Amount
Fy 2012	Great Lakes Comission (GLRI) Hawk Hill Road Project	\$ 293,000.00
Fy 2012	Clean Water Fund-Copperhead Road Project	\$ 212,000.00
Fy 2015	LCMR-Buckthorn	\$ 54,000.00
Fy 2016	DNR-Buckthorn	\$ 12,800.00
Fy 2017	Clean Water Fund-Buckthorn	\$ 144,000.00

How will you sustain and/or maintain this work after the Outdoor Heritage Funds are expended?

A critical component of this project is to insure beaver do not re-impact areas that have been rehabilitated. To insure that these project areas are maintained after the project is complete, annual helicopter flights are conducted to insure beavers do not re-colonize the project areas. These beaver flights are conducted in late autumn by the DNR as they have been previously for over 15 years. If dams or beaver activity is noted in the annual flight, the DNR will contract with Federal trappers to remove the beavers and notch their dams. The estimated cost of the flight, beaver removal and dam notching throughout the entire Knife River watershed is approximately \$15,000. If the DNR loses funding for this project, the TMDL implementation plan has budgeted \$35,000 annually for this task. Included in this budget is beaver flights, trapping, dam notching and supplemental tree planting.

Actions to Maintain Project Outcomes

Year	Source of Funds	Step 1	Step 2	Step 3
July 1, 2018 - June 30, 2019	DNR	Beaver Flights	Beaver Trapping	N/A
July 1, 2018 - June 30, 2019	LSSA	Stream Walk	Beaver Trapping	Tree Planting
July 1, 2019 - June 30, 2020	DNR	Beaver Flights	Beaver Trapping	N/A
July 1, 2019 - June 30, 2020	LSSA	Stream Walk	Beaver Trapping	Tree Planting
July 1, 2020 - June 30,	DNR	Beaver Flights	Beaver Trapping	N/A

2021				
July 1, 2020 - June 30, 2021	LSSA	Stream Walk	Beaver Trapping	Tree Planting
July 1, 2021 - June 30, 2022	DNR	Beaver Flights	Beaver Trapping	N/A
July July 1, 2021 - June 30, 2022	LSSA	Stream Walk	Beaver Trapping	Tree Planting

Activity Details

Requirements

If funded, this program will meet all applicable criteria set forth in MS 97A.056?

Yes

Will restoration and enhancement work follow best management practices including MS 84.973 Pollinator Habitat Program?

Yes

Is the restoration and enhancement activity on permanently protected land per 97A.056, Subd 13(f), tribal lands, and/or public waters per MS 103G.005, Subd. 15?

Yes

Where does the activity take place?

- County/Municipal
- Public Waters

Land Use

Will there be planting of any crop on OHF land purchased or restored in this program?

No

Timeline

Activity Name	Estimated Completion Date
Biological Assessments	July 1, 2018 - June 30, 2022
Reach Survey, Project Design and Regulatory Permitting	July 1, 2018 - June 30, 2022
Design, Build, Restoration and Construction Activities	June 15, 2019 - June 30, 2022
Tree/Shrub Planting	July 1, 2018 - June 30, 2022

Date of Final Report Submission: 06/30/2023

Budget

Budget reallocations up to 10% do not require an amendment to the Accomplishment Plan.

Totals

Item	Funding Request	Antic. Leverage	Leverage Source	Total
Personnel	-	-	-	-
Contracts	\$726,500	\$62,000	Private Source-LSSA, Zeitgeist, Coastal Grant	\$788,500
Fee Acquisition w/ PILT	-	-	-	-
Fee Acquisition w/o PILT	-	-	-	-
Easement Acquisition	-	-	-	-
Easement Stewardship	-	-	-	-
Travel	-	\$7,100	Private Source-LSSA & Zeitgeist	\$7,100
Professional Services	\$131,700	\$10,000	Private Source-LSSA & Zeitgeist	\$141,700
Direct Support Services	-	-	-	-
DNR Land Acquisition Costs	-	-	-	-
Capital Equipment	-	-	-	-
Other Equipment/Tools	-	\$2,500	Private Source-LSSA	\$2,500
Supplies/Materials	\$68,800	\$1,300	Private Source-LSSA	\$70,100
DNR IDP	-	\$60,000	MN DNR-Fisheries (Enhancement-100%)	\$60,000
Grand Total	\$927,000	\$142,900	-	\$1,069,900

Amount of Request: \$927,000

Amount of Leverage: \$142,900

Leverage as a percent of the Request: 15.42%

DSS + Personnel: -

As a % of the total request: 0.0%

Easement Stewardship: -

As a % of the Easement Acquisition: -

How will this program accommodate the reduced appropriation recommendation from the original proposed requested amount?

We will be doing a proportionate amount less work than originally planned. We will be starting on top of Reach Four performing work downstream and ending work at a stable reach approx. 2200 lineal feet from the starting point.

Describe and explain leverage source and confirmation of funds:

LSSA's charitable gaming account, general fund, and in-kind donations. Allocated by LSSA board approval. Zeitgeist operating funds allocated by Zeitgeist board approval. Other Knife River leverage estimated at

\$ 100,000: DNR-weir operation, creel census, temperature monitoring, steelhead relocation, easement work.
County forestry departments also contribute. Lake County SWCD buckthorn.

Contracts

What is included in the contracts line?

Yes-100%.

Federal Funds

Do you anticipate federal funds as a match for this program?

No

Output Tables**Acres by Resource Type (Table 1)**

Type	Wetland	Prairie	Forest	Habitat	Total Acres
Restore	0	0	0	0	0
Protect in Fee with State PILT Liability	0	0	0	0	0
Protect in Fee w/o State PILT Liability	0	0	0	0	0
Protect in Easement	0	0	0	0	0
Enhance	0	0	0	356	356
Total	0	0	0	356	356

Total Requested Funding by Resource Type (Table 2)

Type	Wetland	Prairie	Forest	Habitat	Total Funding
Restore	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	-	-	-	\$927,000	\$927,000
Total	-	-	-	\$927,000	\$927,000

Acres within each Ecological Section (Table 3)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Acres
Restore	0	0	0	0	0	0
Protect in Fee with State PILT Liability	0	0	0	0	0	0
Protect in Fee w/o State PILT Liability	0	0	0	0	0	0
Protect in Easement	0	0	0	0	0	0
Enhance	0	0	0	0	356	356
Total	0	0	0	0	356	356

Total Requested Funding within each Ecological Section (Table 4)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Funding
Restore	-	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-	-
Protect in Easement	-	-	-	-	-	-
Enhance	-	-	-	-	\$927,000	\$927,000
Total	-	-	-	-	\$927,000	\$927,000

Average Cost per Acre by Resource Type (Table 5)

Type	Wetland	Prairie	Forest	Habitat
Restore	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-
Protect in Easement	-	-	-	-
Enhance	-	-	-	\$2,603

Average Cost per Acre by Ecological Section (Table 6)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest
Restore	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-

Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	-	-	-	-	\$2,603

Target Lake/Stream/River Feet or Miles

Enhancement-approx. 2200 lineal feet; direct impact-16.6 miles of river.

Outcomes

Programs in the northern forest region:

- Healthy populations of endangered, threatened, and special concern species as well as more common species ~ *Outcomes will be measured by conducting a baseline assessment and periodic post-construction assessment(s) as necessary. All baseline and post-construction assessments will follow the MPCA Stream Habitat Assessment (MSHA) protocol. This MSHA protocol uses a standardized form to evaluate land use, riparian zone width, bank erosion, percent shade, substrate, embeddedness, siltation, cover type, cover amount, channel depth, channel stability, flow velocity, sinuosity, pool width, channel development and stream modifications. The final MSHA protocol derives a numeric value or score for the stream reach so habitat changes can be evaluated overtime and tracked using standardized scientific criteria as a basis for comparison.*

Parcels

For restoration and enhancement programs ONLY: Managers may add, delete, and substitute projects on this parcel list based upon need, readiness, cost, opportunity, and/or urgency so long as the substitute parcel/project forwards the constitutional objectives of this program in the Project Scope table of this accomplishment plan. The final accomplishment plan report will include the final parcel list.

Parcel Information

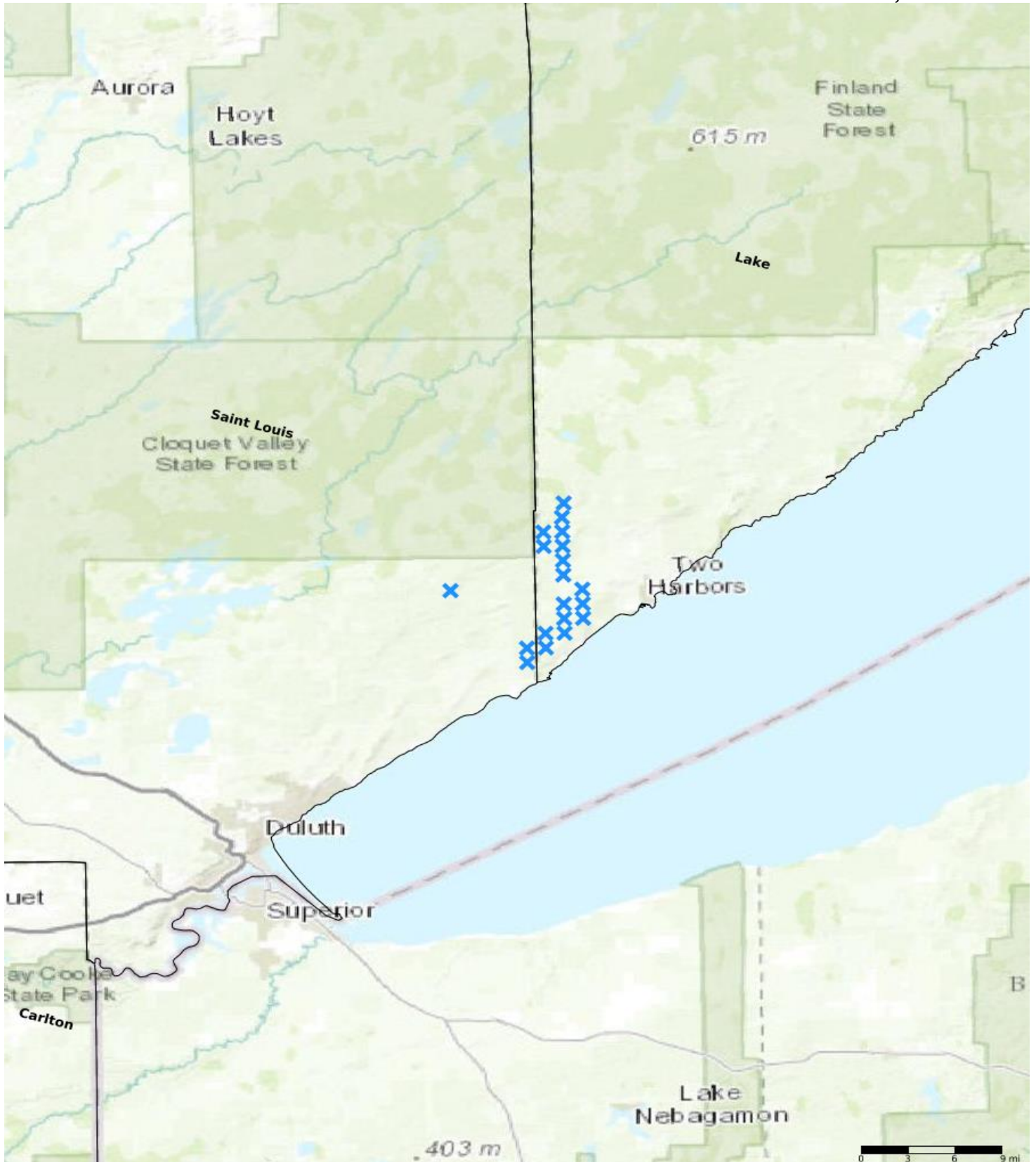
Sign-up Criteria?

No

Explain the process used to identify, prioritize, and select the parcels on your list:

Restore / Enhance Parcels

Name	County	TRDS	Acres	Est Cost	Existing Protection
Knife River	Lake	05312232	0	\$0	Yes
Knife River	Lake	05311220	0	\$0	Yes
Knife River	Lake	05212224	0	\$0	Yes
Knife River	Lake	05311218	0	\$0	Yes
Knife River	Lake	05411232	0	\$0	Yes
Knife River	Lake	05311233	0	\$0	Yes
Knife River	Lake	05311229	0	\$0	Yes
Knife River	Lake	05211205	0	\$0	Yes
Knife River	Lake	05211208	0	\$0	Yes
Knife River	Lake	05311207	0	\$0	Yes
Knife River	Lake	05311217	0	\$0	Yes
Knife River	Lake	05311208	0	\$0	Yes
Knife River	Lake	05311205	0	\$0	Yes
Knife River	Lake	05211204	0	\$0	Yes
Knife River	Lake	05212225	0	\$0	Yes
Knife River	Lake	05211219	0	\$0	Yes
Knife River	Lake	05211209	0	\$0	Yes
Knife River	Lake	05211218	0	\$0	Yes
Knife River	Lake	05211217	0	\$0	Yes



- Protect in Easement
- ▲ Protect in Fee with PILT
- Protect in Fee W/O PILT
- ★ Restore
- ✕ Enhance
- ⊕ Other

Parcel Map
Knife River Habitat Rehabilitation-Phase III
(Data Generated From Parcel List)

